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Article

The Evaluation of the Local Beer Industry during the COVID-19 Pandemic and Its Relationship with Open Innovation

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Abstract: The beer industry is one of the businesses affected during the COVID-19 pandemic. Despite the exponential growth of the beer industry throughout the years, this aspect of the beverage industry has gained limited attention and has been underexplored. This study aimed to provide a better and up-to-date understanding of Philippine-beer consumers to speed up its recovery. An online survey with 853 volunteer respondents was conducted to investigate Filipinos' local beer consumption considering frequency, intake, expenses, and preference. A descriptive analysis of the consumers' self-perceived evaluation of the changes in drinking showed a slight decrease in frequency, intake, and expenses and a minor change in preference. Somers' d and the chi-squared test results indicated significant relationships between each demographic information (age, sex, and income) and frequency, intake, and expenses. In addition, a conjoint analysis with an orthogonal design indicated that price was the most important attribute (58.025%), followed by primary taste (12.452%), alcohol content (9.706%), mouthfeel (6.445%), aftertaste (6.355%), aroma (5.189%), and, lastly, color (1.827%). The findings of this study could be used as a baseline for improved product offerings, customized advertisements, and market segmentation. Moreover, the results of this study could be applied and extended by breweries to promote and create strategies. Lastly, this study could be extended and utilized by other beverage industries worldwide.

Keywords: beer; consumer preference; conjoint analysis; COVID-19 pandemic; expenditure

1. Introduction

Beer is a fermented beverage that has gradually evolved over the years and has become a universal drink. Alcine Chan et al. [1] reported that beer had an exponential growth in the past two decades. Their study explained how considering the traditional taste and rediscovering new tastes are considered as competitive advantages among businesses [1]. Beer is traditionally made following five sets of operations, namely, (1) steeping, germination, and moisture removal from the cereal grains; (2) milling, mashing, and draining; (3) the boiling, clarification, and cooling of sweetened wort; (4) fermentation; and (5) yeast removal, stabilization, and packaging. Although the processes and ingredients used in beermaking have been basically retained, standards have finally been set, and selections continually increase [2].

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The rising number of beer varieties corresponds to the relative preferences of different cultures worldwide. Beer preference is widely affected by availability, habits, and peer experiences, which make up one's cultural identity [3]. The Japanese like beers with pure, light flavors, while the South Asians prefer those with high alcohol content [4]. The Europeans, particularly the Czechs, who account for the highest global beer consumption, are more critical of beer attributes [5]. They consider taste, brand, and quality, and they opt for beers produced locally [6]. In choosing beers, the Germans prioritize type, price, and origin [7].

While beer is constantly present in Filipino households, the selections are limited since there are only two industrial-scale companies that produce less than 15 commercial beer brands. As of 2018, beer comprised only about 27% of the total alcohol consumption of the Filipinos. Despite efforts in advertising conducted by the two companies, the increase in the Philippines' annual beer consumption from 2000 to 2015 was too gradual and was not parallel with the rapidly increasing global consumption gap versus other alcoholic beverages [5]. Presented in Figure 1a–c are the graphical representations of beer consumption worldwide [8]. However, the sales and consumption of local beers were severely affected by the series of government-imposed COVID-19 policies in the first half of 2020 [9,10]. With the easing up of restrictions, breweries focused on online markets, changed advertising strategies, and planned to launch new products. Knowing exactly what customers want would likely help the beer industry recover.

The Filipinos are known for their liking of sweet foods and drinks [11], but no studies have been performed to confirm if such a trend is also applicable to their local beer preferences. In fact, no studies have been conducted yet to particularly assess the Filipinos' choice of local beers made in the Philippines. Existing studies conducted in other countries have focused on combined extrinsic and intrinsic properties, with little emphasis on the full sensory parameters of color, taste, mouthfeel, and aroma [7,12,13]. Furthermore, published reports about the consumption, frequency, and expenses of the Filipinos relatively to beers have all been obtained before the COVID-19 pandemic. Some studies have also covered beer preference across different countries. McCann et al. [14] dealt with the preference for beer among drinkers and nondrinkers from Western New York in the USA. However, their study focused more on the distinction of drinkers based on their demographic characteristics. Sluik et al. [15] dealt with alcoholic beverage preference in association with dietary habits. In addition, Jensen et al. [16] focused their study on the risk of people becoming heavy drinkers considering alcoholic beverages. Lastly, Caetano et al. [17] differentiated beer consumption and preference among different nationalities. However, their study focused on clustering nationalities according to their consumption rather than the type of beer bought by consumers.

The COVID-19 pandemic significantly changed consumer behavior and spending levels [18]. In this study, the researchers assessed consumers' perceived changes in frequency, intake, expenses, and preference relatively to local beers during the pandemic. The effects of the demographic profile on the frequency of drinking, intake, and expenses relative to Philippine beers were also evaluated. This study determined which beer attributes had the greatest influence on purchasing decisions and which combination was the most preferred.

This research study can provide a more precise and timely understanding of customers' choices to Philippine-based breweries. This way, they could improve product offerings appropriate to changing consumer needs. This could help them to target specific consumer groups and come up with strategic advertisements. It would also serve as a quantitative baseline for smaller breweries that would like to upscale production. This study specifically covered generalized attributes of Philippine beers considering color, primary taste, aftertaste, aroma, mouthfeel, alcohol level, and price (300 mL bottle). The results of this study could be generalized among beer breweries worldwide since the Philippines also internationally export locally made beers. Moreover, Caetano et al. [17] pointed out how the nationalities considered in their study presented no significant differences.

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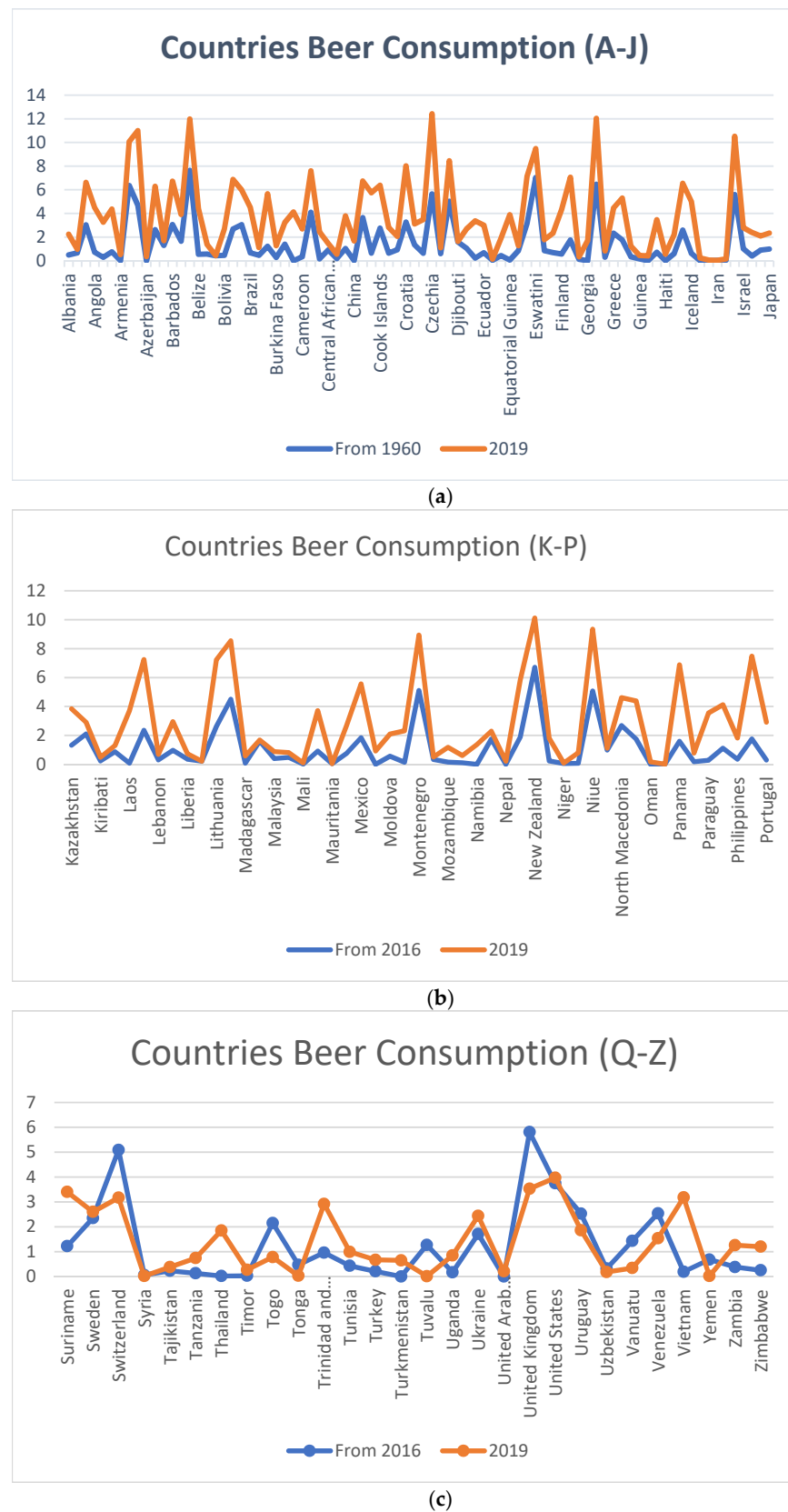
Figure 1. (**a**) Beer consumption by country (A–J). (**b**) Beer consumption by country (K–P). (**c**) Beer consumption by country (Q–Z).

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2. Methodology

2.1. Questionnaire

A three-part online questionnaire was utilized in this study using Google forms. The first part contained demographic information such as age group, sex, and individual monthly income or allowance, following which multiple-choice questions about the frequency of drinking, intake, and expenses relative to local beers were asked. Each had a related follow-up question about the self-perceived degree of change incurred during the COVID-19 pandemic. In addition, the extent to which respondents' preferences for local beers changed during the pandemic was also asked. The follow-up questions and the last question were all answerable using a 7-point Likert scale. Lastly, respondents had to rate each beer combination using a 7-point Likert scale. Table 1 shows the attributes and attribute levels considered, where prices are in Philippine pesos (PHP), equivalent to USD 0.019. In addition, Table 2 shows sixteen (16) combinations that were generated using the Orthogonal Design tool in SPSS 26. A Google form was circulated online using platforms such as Facebook, Messenger, and Reddit. The survey period lasted from September 23 to 2 October 2021. The questionnaire is shown in Appendix A, Table A1.

Table 1. Attributes of Philippine beers.

Attribute	Attribute Level
Color	Blonde Amber
Primary taste	Full/bitter Sweet
Aftertaste	Bitter Crisp/almost none
Aroma	Malty Fruity
Mouthfeel	Astringent/dry Smooth
Alcohol level	<4.9 (low) 4.9–5.4 (moderate) >5.4 (high)
Price of 330 mL bottle	PHP 41–60 PHP 61–80 PHP 81–100

Before employing the survey, a preliminary run was performed for the generated orthogonal design to determine the acceptability and validity of the combinations. The preliminary result presented a Person's r value of 0.921, which showed the validity of the combinations considered [19–21]. Afterward, the full distribution of the online survey was conducted. De Guzman et al. [11] explained how the orthogonal design for conjoint analysis is appropriate to determine the optimum combinations presented as compared with the full design, which produces thousands of combinations depending on the number of attributes and attribute levels considered. Their study also considered beverage preference with conjoint analysis using an orthogonal design. Hair et al. [19] explained how the orthogonal design is a type of design that is effective as long as the statistical results for correlation (i.e., Kendall's tau and Pearson's r) are within the threshold of 0.7 or over. Thus, with the preliminary results, it could be deduced that the conjoint analysis with an orthogonal design was deemed acceptable and effective in evaluating beer industry preference.

Table 2. Stimuli generated with the orthogonal design.

Beer Number	Color	Primary Taste	Aftertaste	Aroma	Mouthfeel	Alcohol	Price
B1	Blond	Sweet	Bitter	Malty	Astringent	Low	81–100
B2	Amber	Full	Bitter	Fruity	Smooth	Low	41–60
B3	Amber	Sweet	Crisp	Malty	Astringent	Low	41–60
B4	Amber	Full	Crisp	Malty	Astringent	Low	61–80
B5	Blond	Full	Bitter	Malty	Astringent	Low	41–60
B6	Blond	Full	Crisp	Malty	Smooth	High	81–100
B7	Blond	Full	Bitter	Fruity	Astringent	High	41–60
B8	Amber	Full	Bitter	Malty	Smooth	Moderate	41–60
B9	Amber	Sweet	Bitter	Fruity	Smooth	Low	81–100
B10	Blond	Sweet	Crisp	Fruity	Smooth	Low	41–60
B11	Blond	Full	Crisp	Fruity	Smooth	Low	61–80
B12	Blond	Sweet	Crisp	Malty	Smooth	Moderate	41–60
B13	Amber	Sweet	Bitter	Malty	Smooth	High	61–80
B14	Blond	Sweet	Bitter	Fruity	Astringent	Moderate	61–80
B15	Amber	Full	Crisp	Fruity	Astringent	Moderate	81–100
B16	Amber	Sweet	Crisp	Fruity	Astringent	High	41–60

2.2. Demographic Profile of Respondents

A total of 853 Filipinos of legal drinking age (18 years old and above) willingly participated in the online questionnaire and were selected using a convenience sampling approach. All of them drank beers made in the Philippines at least once a month. Considering the age group, most of the respondents belonged to Generation Z (Gen Z; 27.9%). The percentages of Millennials (24.3%), Baby Boomers (24%), and Generation X (Gen X; 23.8%) followed closely. Males comprised 50.8%, while females made up 49.2% of participants. The last characteristic considered was the individual monthly earnings, wherein the categories were based on the updated income groups in the Philippines [22]. Participants that earned less than PHP 21,914 were considered to belong to the low-income and poor category and comprised most respondents (41.6%). There were 24.4% participants belonging to the lower–middle class who earned from PHP 21,914 to 43,828, 22.7% belonging to the middle–middle class who earned from PHP 43,829 to 76,698, and only 11.3% who earned more than PHP 76,698, who are considered to belong to the upper–middle and rich group. Presented in Table 3 are the descriptive statistics of the demographics considered in this study. The demographics were characterized based on separated age groups following Marinelli et al. [23]. In their study, it was stated that the age groups based on the generation of participants had an influence on their alcoholic consumption. Thus, this study opted to categorize demographics based on generational cohorts.

Table 3. Demographic profile of the respondents.

Characteristic	Category	Frequency	Percent
Age group	Baby Boomer (Birth Year: 1946–1964)	205	24.0
	Gen X (Birth Year: 1965–1976)	203	23.8
	Millennial (Birth Year: 1977–1995)	207	24.3
	Gen Z (Birth Year: 1996–2003)	238	27.9
Sex	Female	420	49.2
	Male	433	50.8
Individual monthly income/allowance	Less than PHP 21,914	355	41.6
	PHP 21,914–43,828	208	24.4
	PHP 43,829–76,698	194	22.7
	>PHP 76,698	96	11.3

2.3. Statistical Analysis

A descriptive analysis was used to evaluate the perceived changes in frequency, intake, expenses, and preference relative to Philippine beer. Consumers' perceived changes in frequency, intake, expenses, and preference were determined. For frequency, intake, and expense, 7 in the Likert scale corresponded to "Remarkably Increased", while 1 corresponded to "Remarkably Decreased". For preference, 7 meant "Changed completely", while 1 corresponded to "No change at all". The chi-squared test and Somer's d statistics were used to determine the relationships between demographic information and frequency, intake, and expenses. Finally, consumer preference was established using a conjoint analysis. In similar, related studies, conjoint analyses have been utilized to determine food preference [11], education [20], and different businesses [11]. All tests were performed utilizing IBM SPSS Statistics Version 26.

3. Results

3.1. Perceived Changes in Drinking Aspects

Table 4 summarizes the results of the descriptive analysis. For frequency, intake, and expenses, the means were 3.7128, 3.6506, 3.5909, and 3.1958, respectively. The mean of the perceived change in preference was 3.1958. The values of standard deviation for frequency, intake, expenses, and preference were considerably low, indicating that the data were mostly scattered near the mean [24]. The collective change in preference was confirmed with a mean of 3.1958. This indicates that the frequency of drinking was the highest during the COVID-19 period, followed by the intake. Expenses were also greater; however, preference was found to have the lowest mean. This means that preference was the least regarded aspect as long as the Filipinos in the study had an alcoholic intake, regardless of expenses and preferences. Further analyses and discussion are presented below.

Table 4. Descriptive analysis results of perceived changes in drinking aspects.

Drinking Aspect	Mean	Std. Deviation
Frequency	3.7128	1.65606
Intake	3.6506	1.65438
Expenses	3.5909	1.74158
Preference	3.1958	1.77499

3.2. Relationship between Demographic Profile and Frequency, Intake, and Expenses

The Somers' d statistics was used to evaluate the relationships between age and income, and frequency, intake, and expenses, with pairs as ordinal variables [25]. All relationships were found to be statistically significant. The crosstabulations can be found in Appendix B, Table A2. Table 5 summarizes the values of Somers' d. Considering the age group where all Somers' d values were negative, going from Gen Z to Baby Boomer yielded high frequency, intake, and expenses in relation to drinking Philippine beers. Age improved the prediction of expenses by 44.5%, while it improved that of intake by 37.8% and that of frequency by 36.7%. This means that age was significantly related to the consumption of beer with regards to frequency, intake, and expenses, with generations from Gen Z to Baby Boomers being highly likely to consume beer. The younger the generation was, the more likely they consumed beer in the Philippines.

Table 5. Summary of Somers' d values for age group.

Relationship	Somer's d Value	Asymptotic Standard Error
Age and frequency	−0.367	0.024
Age and intake	−0.378	0.023
Age and expenses	−0.445	0.022

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All Somers' d values were positive considering monthly income, as seen in Table 6. This indicates that the increase in income led to an increase in the frequency of drinking, intake, and expenses in relation to local beers. Income improved the prediction of expenses by 42.6%. It reduced the errors of the prediction of frequency and intake by 22.9% and 23.9%, respectively.

Table 6. Summary of Somers' d values for monthly income.

Relationship	Somer's d	Asymptotic Standard Error
Income and frequency	0.229	0.028
Income and intake	0.239	0.028
Income and expenses	0.426	0.025

To relate sex with frequency, intake, and expenses, a chi-squared test of association was used as shown in Table 7. At a 5% level of significance, there was a significant association between sex and frequency, sex and intake, and sex and expenses. Based on the Cramer's V test, sex had the strongest relationship with intake.

Table 7. Test of association for sex.

Relationship	Pearson Chi-Squared Value	Cramer's V	Strength of Association [15]
Sex and frequency	105.501	0.352	Very strong
Sex and intake	155.005	0.426	Very strong
Sex and expenses	41.58	0.221	Strong

3.3. Conjoint Analysis

Table 8 summarizes the values of the utility estimates. The results present that the most preferred color was blond (0.013). This indicates that lighter-colored beers were more prominent among consumers. In addition, a sweet primary taste was more preferred (0.090) than a full taste (-0.090). It was indicated in the study by de Guzman et al. [11] that Filipinos preferred taste in relation to food and beverages. The results therein presented are consistent with our findings in this respect. Consumers generally preferred a crisp or almost no aftertaste (0.046) over a bitter one (-0.046) and a malty aroma (0.038) over a fruity smell (-0.038). Consistently, Filipinos referred to alcoholic beverages for their mouthfeel—presenting how they were more sensitive. For alcohol levels, the most often chosen level was moderate (0.083), while low (-0.026) and high (-0.057) levels were not preferred. This indicates that consumers were more likely to drink for casual or occasional reasons rather than for heavy alcohol consumption. Lastly, the lower the price of beer was (0.370), the better it was for customers.

The Importance of Value Score is presented in Table 9. Out of the seven beer attributes, price had the highest importance for customers in the Philippines. Next was the primary taste, which was followed closely by the alcohol level. This was followed by mouthfeel, aftertaste, and aroma, whose importance values were close to one another. Color was the least important attribute among consumers.

Table 10 shows the ranking of the beer combinations in terms of utility, in descending order. The beer column represents the different combinations from B1 to B16 as reflected in Table 2—"Stimuli generated with the orthogonal design". B12—with a blond color, a sweet taste, a crisp aftertaste, a malty aroma, a smooth mouthfeel, a moderate alcohol content, and a low price—had the highest utility score (0.687). Meanwhile, B15—with an amber color, a full taste, a crisp aftertaste, a fruity odor, an astringent mouthfeel, a moderate alcohol level, and a high price—was the least preferred beer combination (-0.527). With the highest combination (B12), the results indicate that Filipino consumers preferred the cheapest alcoholic beverage that was the most sensitive in terms of mouthfeel with a sweeter taste. On the other hand, consumers disliked darker-colored, heavy-mouthfeel, and expensive

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alcohol. This key highlight could be capitalized on by marketers to provide profitable types of beers.

Table 8. Summary of utilities.

		Utilities	
		Utility Estimate	**Std. Error**
Color	Blond	0.013	0.022
	Amber	−0.013	0.022
Primary taste	Full	−0.090	0.022
	Sweet	0.090	0.022
Aftertaste	Bitter	−0.046	0.022
	Crisp	0.046	0.022
Aroma	Malty	0.038	0.022
	Fruity	−0.038	0.022
Mouthfeel	Astringent	−0.047	0.022
	Smooth	0.047	0.022
Alcohol	Low	−0.026	0.029
	Moderate	0.083	0.034
	High	−0.057	0.034
Price	41–60	0.370	0.029
	61–80	0.099	0.034
	81–100	−0.469	0.034
(Constant)		4.068	0.024

Table 9. Importance of values.

Importance of Values	
Color	1.827
Primary taste	12.452
Aftertaste	6.355
Aroma	5.189
Mouthfeel	6.445
Alcohol	9.706
Price	58.025

As shown in Table 11, the value of Pearson's r for this study was 0.990 which is considered as a strong correlation [21,26]. The resulting the Kendall's tau value was 0.917, which signifies a very strong agreement between the rankings [11,20,27]. Therefore, it could be deduced that there was internal validity among the combinations considered in this study [11,19–21].

Table 10. Stimulus ranking.

Beer	Utility Estimate
B12	0.687
B10	0.503
B8	0.388
B16	0.352
B5	0.213
B2	0.204
B3	0.186
B13	0.156
B14	0.155
B7	0.106
B11	0.051
B4	0.006
B1	−0.447
B9	−0.455
B6	−0.473
B15	−0.527

Table 11. Results of correlation.

	Value	Sig.
Pearson's r	0.990	0.000
Kendall's tau	0.917	0.000

4. Discussion

4.1. Perceived Changes in Drinking Aspects

In this study, the perceived changes in frequency, intake, and expenses as reported by the participants leaned towards "Decreased". Most existing studies, however, have shown contradictory results. The frequency of drinking beer and other alcoholic drinks increased in Canada [28] and in the USA by almost 14% [29] during the COVID-19 pandemic. Increased frequency has been correlated with more lockdowns in an area [30]. Regarding intake, an increase in alcohol consumption has been observed in the USA [29,31], the UK [32], and Australia [33]. In addition, the study by Alpers et al. [34] reported Millennials to have increased their alcoholic intake during the COVID-19 pandemic as compared with the older generation. It was found that people working and studying at home and those presenting economic worries were the ones correlated with alcoholic consumption. These published studies attributed this increase to alcohol's role as a coping mechanism for boredom, stress, trauma, and anxiety—worries during the lockdown in general [34]—and pre-existing mental illness [35], similarly to what happened during the SARS outbreak, 911 attack, and 2008 Great Recession [36]. Separate studies [37–39] have found a rise in beer sales in countries that were quick to adapt to e-commerce, particularly during the onset of the pandemic [40]. The false belief that drinking alcohol would make one immune to COVID-19 also contributed to the sales boom [41].

Meanwhile, similar to the results of this study, declines in beer consumption, frequency, and expenses have been observed in China [42], most parts of Europe [37], and Africa. This could be due to lockdowns that resulted in job losses [43]. After all, availability and affordability were the main factors considered by consumers in alcohol use during the pandemic [11,37]. The focus of people, especially those from low-income countries, became concentrated on only buying necessities [44]. The perceived decrease in frequency, intake, and expenses related to local beers in this study can also be attributed to the series of liquor bans imposed in the Philippines, which restricted access and capacity to purchase. The noticeable perceived change in preferences is consistent with studies that claim that brand shifting can be due to increased buying experience and awareness of consumers [44,45], as well as their desire for transformation [46].

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4.2. Relationships between Demographic Profile and Frequency, Intake, and Expenses

According to the results of this study, older age groups reported higher frequency, intake, and expenses with regard to drinking beer. This is consistent with most studies relating age to the amount of alcohol consumed and the frequency at which it is consumed [47,48]. In 2009, it was proven for 35 countries in the years from 1997 to 2007 that the frequency of drinking beer and the intake did not decrease with age [49]. Needless to say, older consumers spent a bit more on alcoholic drinks such as beer [50]. Rising skepticism with respect to health risks, self-reward for difficult days, social isolation, depression, and pre-existing illness—which are more prominent in aging people—are the most probable reasons for the increase in frequency, intake, and purchase [51,52].

The next demographic factor, sex, was found to be strongly associated with the frequency of drinking, intake, and expenses relative to Philippine beers in this research study. In fact, there were claims that it was the only demographic factor that affected the drinking patterns in the four European countries considered in a comparative study [53]. Several studies have suggested that males generally show higher consumption and frequency of drinking beer. In a study on the consumption behaviors of older adults, it was found that males tended to drink more glasses of beer in increased frequencies than females [54]. Furthermore, the decline in alcohol consumption was more pronounced in females, particularly during the COVID-19 lockdown [55]. According to recent research regarding expenditure, males tended to spend more money on beer than females, who spent mostly on wine [56]. Males' general inclination to beer, which includes prevalence and amount of drinking as well as related expenses, is partly genetically amplified by masculine culture according to Iwamoto and Smiler [57].

The last demographic factor considered was monthly income. This study shows that higher monthly income or allowance led to higher ranks of frequency, intake, and especially expenses. Our results are similar to the findings obtained by Marinelli et al. [23], who stated that the older the age group was, the higher the level of professionalism was, and a decrease in beer consumption was seen in relation to income. It was observed that the oldest age group preferred wine over beer. Partly, the findings also agree with a research study that demonstrated that people in the upper-income bracket could afford socialization that involved drinking often in low amounts [58]. During the pandemic, wherein gatherings were carried out virtually in a setup where they also carried out their job, high-income drinkers were also characterized by confined-work-related stress [59]. Thus, there is a relationship between higher income and beer consumption.

4.3. Conjoint Analysis

From the conjoint analysis, the most preferred beer stimuli were blond, sweet, smooth, malty smelling, moderate alcohol level, and low price with a negligible aftertaste. This constituted a 1.101 score. Consequently, customers paid importance to price (58.25%), primary taste (12.452%), alcohol (9.706%), mouthfeel (6.445%), aftertaste (6.355%), aroma (5.189%), and color (1.827%). Moreover, consumers disliked beers characterized by an amber color, a full taste, a bitter aftertaste, a fruity aroma, an astringent mouthfeel, a low or high alcohol level, and a high cost, with a −0.760 score. From the alcohol-level perspective, it is interesting that consumers preferred mild alcohol levels over low and high levels.

Although the Czechs, who are considered top beer drinkers, do not consider price when choosing local beers [6], most consumers, particularly from lower-income countries, treat it as a huge determinant for brand loyalty [60]. It was even concluded in a research study that the increase in beer price led to reduced consumption and sales [61]. Similar to the results of this study, the increase in the alcohol level is likely not preferred by consumers in the Philippines. Usually, people in the Philippines like to consume alcohol as a way to unwind and relax [62]. In addition, consuming alcoholic beverages is related to psychological distress, such as anxiety and depression [63]. This results in considering alcohol as a temporary escape, and the results showed that as long as there was alcohol present, people consumed it regardless of the other attributes. This was verified by the

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significant difference in the percent score of importance, 58.025% compared to the second, i.e., 12.425%, while the scores were in single digits for the rest of the attributes.

Taste, alcohol, and aroma are closely related characteristics that are influenced by beer biochemical composition. Factors that affect them simultaneously include volatile compounds, polyphenols, yeast metabolism, contaminant microorganisms, strategies for control, and raw materials [64]. Moreover, large amounts of volatile compounds such as fusel alcohols result in a bitter taste coupled with a strong odor, whereas lower levels lead to milder and sweeter taste and smell [65]. Despite this, consumers cannot normally distinguish beers with low alcohol content from those with high alcohol content using taste and smell alone [64]. Therefore, it was important that alcohol content was treated separately in this study. From the results, the alcohol level turned out to be the second most important factor considered by the respondents. In most publications, however, the alcohol content of beer is given low importance [66]. In this study, moderate alcohol levels were favored by the participants. Such an intermediate position can be backed by studies claiming that higher-alcohol beer is preferred by sensation-seeking populations of low-income countries [67], while lower-alcohol beer demand is increasing due to its refreshing, fruity, and nutritious nature [68].

In the Philippines, typical low-income groups consume cheaper-priced alcohol for fun, relaxation, and even gatherings. One of the most popular beers in the Philippines is San Miguel Pale Pilsen (330 mL), which costs less than USD 1. In addition, it was reported that the consumption of high levels of alcohol content has reduced, while that of low-level alcohol content has increased [67]. Given these data, the beer industry was projected to increase from USD 2 billion in 2015 to USD 3.41 billion in 2025. It was also added that the focus of business nowadays is the quality and consumer preferences rather than the quantity produced [69]. Thus, the result of this preference study could have a huge impact on breweries' strategies.

Mainly depending on the quality of hop used, taste and aroma significantly affect customers' willingness to pay [70]. Contrary to this study's findings, bitter beers with a prominent hop taste were reported to be preferred globally [67,71]. There are groups of people known as supertasters, characterized by a high papilla density that leads to an inclination to sweetness and aversion to bitterness [72]. In addition to the huge amount of sweet foods in the Filipinos' diet, this could explain their liking of sweeter beers, since taste preference is related to genetic predisposition [11,73]. Some studies have claimed, however, that female like sweet beers while males like bitter beers [13].

Unlike this study, previous works have ranked aroma higher than other factors that affect beer preferences [74]. While the increasing demand for sweet-aroma beverages switched most brewers' focus to fruity flavor profiles [75], the Filipinos seem to prefer malty or stronger-smelling beers. This is consistent with the experiment where hopped beers with a more pronounced aroma were given high ratings in sensory evaluation [76]. Such finding could be a result of the malt-leaning olfactory marketing practices in the Philippines, wherein companies attract customers using the sense of smell [77].

Mouthfeel and aftertaste also influenced the buying decisions of beer drinkers. Aftertaste refers to the residual sensation after the removal of the oral stimulus [78], while mouthfeel is more related to the frictional properties of beer [79]. Mixed reactions are expected for these factors, since individuals have different salivary flow rates [80] and expressions of bitter-taste receptors [69]. The reaction of proteins in the saliva and polyphenols in the beer causes both a drying sensation and a bitter aftertaste [81]. As shown by the results of this study, a less pronounced aftertaste and a smooth mouthfeel were preferred. This is consistent with the global trend that lobbied efforts to remove astringent compounds that cause a bitter aftertaste and a dry mouthfeel, such as the use of subcritical water [82].

Although color played low importance in Filipinos' choice of local beers, as shown in this study, it sets expectations and perceptions of the entire multisensory experience [83,84]. Filipinos' preference for blond beers over amber beers is consistent with the other findings of this study about taste and price. Note that darker-colored beers are associated with bitter

taste [84] and expensive price [85,86]. Most beers in the Philippines are light–golden yellow, so familiarity could also account for this. Consequently, it could be highlighted that taste, along with the correct level of alcohol, mouthfeel, aftertaste, and aroma, is likely a primary factor for consumption. In addition, bottled-beer designs could also be considered [87]. Thus, breweries could consider the findings of this study for the strategic planning and regrouping of the promotional aspects of beers to be sold.

4.4. The Relationships among Beer, Food, Restaurants, and Open Innovation

From the perspective of open innovation, the analysis of preference when it comes to market strategies for the consumption of beer may be highlighted. Lee and Yoo [88] explained how open innovation pertain to the open method of collaboration and development to create new products or services. Since this study focused on the preference analysis and perceived changes in drinking habits, businesses may capitalize on these prospects for market penetration. It was seen that beer consumers in the country focused on taste and price the most, which gives many opportunities to worldwide businesses to create products based on the preferred sweetness among the Filipinos. This is supported by the study by de Guzman et al. [11], wherein the Filipinos were reported to be highly inclined toward the nutrition-related side of food, focusing on its taste. It could be suggested to create a collaboration with local beer manufacturers when international brands want to penetrate the market to create more holistic business plan and strategy. Similarly, it was suggested [89,90] that current businesses utilize open innovation approaches to create business plans to increase sales through the distinct attitude and behavioral aspects of consumers. Thus, this study presents a great platform for breweries, beverage industries, and stakeholders to promote products focused on an aspect of the beverage.

Recently, businesses have been recreating business models and strategies to cater for the behavioral changes seen in consumers [91–106]. This study would be beneficial in this sense, since a demographic segmentation of consumer preferences was also indicated. Consumer preferences were evaluated and were found to be mostly focused on the practical side, such as taste and price, as evident from the results of this study. Thus, brands and breweries may capitalize on this aspect and deal with these attributes to promote profit among beer drinkers. The cultural foundation seen in organizations nowadays focuses on open innovation; thus, this study helps to provide business leadership, strategy, and segmentation advantages. This would allow organizations to have a competitive edge, which would lead to increases in sales and brand recognition by consumers.

In addition, the selling and buying behaviors during the COVID-19 pandemic were evaluated in this study. This could be capitalized on by different beverage, food, and restaurant industries. Misra and Mention [107] explored the open innovation aspects regarding the food value chain. Their study highlighted the need to innovate by utilizing technology such as e-market and e-commerce, digital media to advertise and sell the products, and takeaway foods. It was suggested that food transition and food transformation may be applied in this pandemic, since individual practices and experiences were evident during the COVID-19 pandemic [108]. Collaboration and partnership with regards to the process, selling, and co-creation of customer value may be considered to gain marketing advantage in the food and restaurant industry [109]. This is one key strategy to promote and maintain a competitive advantage among others. Taking for example the partnership of Coca-Cola with Jack Daniels to market one product, further innovation with regards to food and restaurants, as well as beverages, may also be considered and capitalized on as open innovation to gain more customers and profitability [110].

5. Conclusions

Conducted during the COVID-19 pandemic, this study discussed the Filipinos' consumption habits and preferences regarding local beers. The mean values from the data indicated a very slight decrease in the perceived change in frequency, intake, and expenses during the pandemic among the Filipinos. The perceived change in preference

was confirmed to have the highest mean result among others. The effects of demographic information such as age, sex, and monthly income on the frequency, intake, and expenses of consumers relatively to Philippine beers were evaluated. Using Somer's d, it was found that frequency, intake, and expenses increased with age and income. Using the chi-squared test for association, the researchers found a significant association between sex and frequency, intake, and expenses at the 5% level of significance. Moreover, utilizing Cramer's V, the strengths of the associations between sex, and frequency and intake were found to be very strong, whereas the relationship between sex and expenses was strong.

With the aim to determine beer consumption preferences in the Philippines, the conjoint analysis showed that price affected customers' choice of beer the most, while color had the lowest importance. The most preferred beers were characterized by a blond color, a sweet taste, a crisp aftertaste, a malty aroma, a smooth mouthfeel, a moderate alcohol content, and a low price. While some of the results agree with limited existing publications, others are unexpected, thereby validating the need to conduct up-to-date consumer behavior and preference studies such as this. It could be deduced that a lower price, a sensitive mouthfeel, and a sweeter taste cater to consumers in the Philippines. This could be capitalized on by marketers when promoting products. In addition, breweries may change their perspective to create types of beers to widely offer on the market.

It could also be deduced from the results that consumers preferred beers with low levels of alcohol since it was consumed for gathering, relaxation, and destressing. It could be highlighted that low-income groups highly preferred cheaper beers regardless of other attributes. Though primary taste, alcohol level, mouthfeel, aftertaste, and aroma were seen to be significant, the importance scores were seen to be relatively below the median, and prices affected consumer preference. Moreover, color was the least noticeable beer attribute for consumers. The findings of this study could be applied for strategic planning and advertising to promote beer products in the Philippines. The attributes and findings of this study can also be applied and extended by researchers and breweries in different countries. Lastly, this study can be applied to other beverages available worldwide by evaluating the preferences for taste, mouthfeel, and beverage texture [87]. As presented in the discussion, it could be posited that these attributes may have different results depending on the developed taste in other countries [10].

Limitations and Future Research

This study only confirmed the changes in consumer behavior towards Philippine beer during the COVID-19 pandemic. A quantitative measure of the extent of the changes during the COVID-19 pandemic could also be considered. Although more than 800 respondents from representative age groups were recruited, a higher number of more randomized populations from all over the Philippines, considering both rural and urban areas, is needed for a better generalization, since differences in available products are present in different areas. The demographic information of respondents could also include the nature of their occupation, educational attainments, and marital status. Market segmentation could be performed as a further step through k-means clustering. In addition, an evaluation of available beers that matched the most preferred characteristics in this study could also be performed, or laboratory-scaled production could be initiated in case no such beer is available. Note, however, that this study utilized a survey wherein consumers had to rank beers based on combined sensory-focused attributes, thereby heavily relying on their expertise, imagination, and memory to conjure the specific combination. Therefore, a series of hedonic sensory analyses and blind tasting are recommended for confirmation prior to launching product offerings based on this study's results. Future studies could consider more utilities and levels, which may include other intrinsic properties such as foaming and extrinsic properties such as packaging and brands. Moreover, while this study focused on commercial Philippine beers, it could also be applied to other beverages, such as craft beers, which may have different a niche but are an equally struggling product line.

Appendix A

Table A1. Questionnaire used during the survey study.

Part 1. Demographics		
Age Group	( ) Baby Boomer (Birth Year: 1946–1964) ( ) Gen X (Birth Year: 1965–1976) ( ) Millennial (Birth Year: 1977–1995) ( ) Gen Z (Birth Year: 1996–2003)	
Sex	( ) Female	( ) Male
Monthly Income / Salary	( ) Less than 21,914 PHP ( ) 21,914–43,828 PHP ( ) 43,829–76,698 PHP ( ) >76,698 PHP	

Part 2. Frequency, Intake, and Expense on Beers			
How often did you normally drink local beers in a month?			
( ) 1 to 4 times	( ) 5 to 8 times	( ) 9 to 12 times	( ) More than 12 times
During COVID-19 pandemic, how has your frequency (dalas) of drinking local beers changed? ( ) Remarkably increases ( ) Increases ( ) Slightly increases ( ) Did not change ( ) Slightly decreases ( ) Decreases ( ) Remarkably decreases			

How many 330mL bottles of local beers did you normally consume in a month?				
( ) 1 to 6	( ) 7 to 12	( ) 13 to 18	( ) 19 to 24	( ) More than 24
During COVID-19 pandemic, how has your intake (dami) of local beers changed? ( ) Remarkably increases ( ) Increases ( ) Slightly increases				

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Table A1. *Cont.*

( ) Did not change ( ) Slightly decreases ( ) Decreases ( ) Remarkably decreases		
How much did you normally spend for local beers in a month?		( ) 1000 to 1499 PHP
( ) Less than 500 PHP	( ) 500 to 999 PHP	
( ) 1500 to 1999 PHP	( ) 2000 and above PHP	
During COVID-19 pandemic, how has your expenses on local beers changed? ( ) Remarkably increases ( ) Increases ( ) Slightly increases ( ) Did not change ( ) Slightly decreases ( ) Decreases ( ) Remarkably decreases		
During COVID-19 pandemic, how much has your preference on local beers changed?		
( ) 7—changed completely ( ) 6 ( ) 5 ( ) 4 ( ) 3 ( ) 2 ( ) 1—no change		
Part 3. Conjoint Analysis		
How willing are you to buy each? Rate each 330 mL local beer based on your preference. (7—highest; 1—lowest)		

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Appendix B

Table A2. Crosstabulations for effect of demographic profiles.

		Frequency				Expense					Intake					Total
		1–4 Times	5–8 Times	9–12 Times	More than 12 Times	Less than PHP 500	PHP 500–999	PHP 1000–1499	PHP 1500–1999	PHP 2000 and above	1–6	7–12	13–18	19–24	More than 24	
Age Group	Boomer	7	77	89	32	9	47	85	39	25	5	56	45	55	44	205
	Gen X	15	84	75	29	14	71	70	27	21	12	80	41	28	42	203
	Millennial	112	47	34	14	92	64	30	12	9	95	51	24	19	18	207
	Gen Z	127	61	37	13	135	66	26	4	7	109	72	33	6	18	238
Total		261	269	235	88	250	248	211	82	62	221	259	143	108	122	853
Monthly Income	<PHP 21,914	158	96	62	39	169	108	56	7	15	131	109	51	18	46	355
	PHP 21,914–PHP 43, 828	75	57	56	20	61	78	41	16	12	64	61	29	29	25	208
	PHP 43, 829–PHP 76, 698	17	86	73	18	13	56	75	40	10	13	67	42	44	28	194
	>PHP 76, 698	11	30	44	11	7	6	39	19	25	13	22	21	17	23	96
Total		261	269	235	88	250	248	211	82	62	221	259	143	108	122	853
Female	Count	148	181	77	14	158	126	91	25	20	134	184	61	23	18	420
	Expected Count	128.5	132.5	115.7	43.3	123.1 37.6%	122. 130.0%	103. 921.7%	40.4 6.0%	30.5 4.8%	108.8	127.5	70.4	53.2	60.1	420.0
Male	Count	113	88	158	74	92	122	120	57	42	87	75	82	85	104	433
	Expected Count	132.5	136.5	119.3	44.7	126.9 21.2%	125.9 28.2%	107.1 27.7%	41.6 13.2%	31.5 9.7%	112.2	131.5	72.6	54.8	61.9	433.0
Total	Count	261	269	235	88	250	248	211	82	62	221	259	143	108	122	853
	Expected Count	261.0	269.0	235.0	88.0	250.0 29.3%	248.0 29.1%	211.0 24.7%	82.0 9.6%	62.0 73%	221.0	259.0	143.0	108.0	122.0	853.0

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